

A gas-phase chemical reduction process

"At ECO LOGIC our business is the future. It is our intent to make our environment clean and safe for future generations."

Dr. Douglas J. Hallett
President & CEO
ELI Eco Logic International Inc.
Rockwood, Ontario.

THE COMPANY

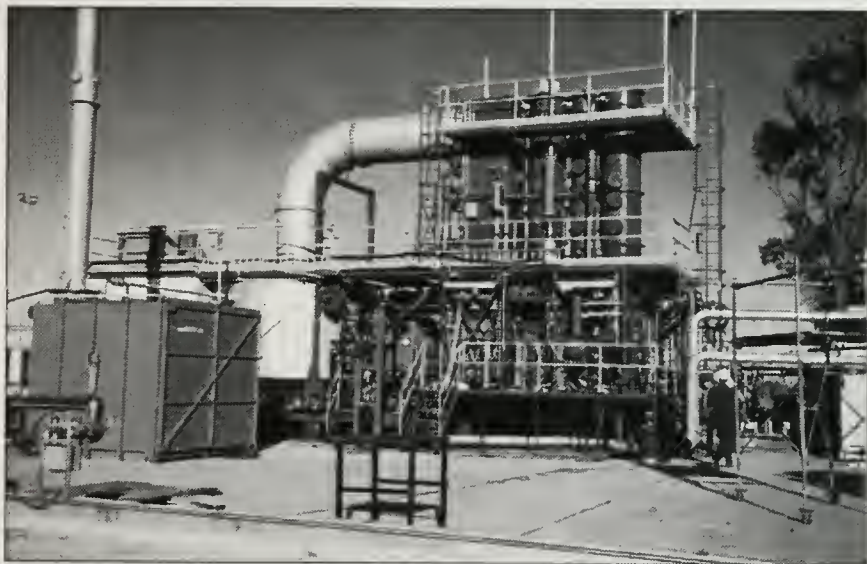
ELI Eco Logic International Inc. (ECO LOGIC) was formed in 1986 to create a commercially viable alternative to incineration for the destruction of high hazard organics. The company employs more than 80 professional and support staff at offices in Rockwood, Ont. and Ann Arbor, Mich.

The company also operates a Technical Services Division, which markets a continuous ionization mass spectrometer. ECO LOGIC is a publicly traded company currently listed on the Toronto Stock Exchange.

CHALLENGE

ECO LOGIC developed its patented closed loop system as an innovative alternative process to incineration. What was needed was a solution to eliminate toxic waste on site with a portable and cost effective unit. Further, this process should not produce emissions or leave hazardous organic residues.

The ECO LOGIC Process is a unique method of treating and recycling large quantities of hazardous organic contaminants, such as polychlorinated biphenyls (PCBs). The process effectively converts hazardous organic compounds into recyclable, reusable or safely disposable products by using a patented gas-phase chemical reduction process. Further, the closed-loop design ensures there are no uncontrolled emissions. The ECO LOGIC Process is not an incinerator so there is no opportunity for the incidental formation of dioxins and furans.



The ECO LOGIC Process for destruction and recycling of organic contaminants

The ECO LOGIC Process equipment is mobile. This means it can be brought on-site and taken away when the waste is processed. The technology can recycle any form of organic contaminant, at any concentration and in any medium including soils, sediments, liquids, and solids.

TECHNOLOGY DESCRIPTION

The ECO LOGIC Process uses vapor phase chemical reduction to reform organic contaminants into reusable or recyclable materials. These reactions take place in a hydrogen-rich reducing atmosphere at elevated temperatures under nominal pressure.

The process breaks down any organic compound and reforms them into methane or natural gas. This gas product is siphoned from the process, stored in a tank and tested. Following the analytical verification phase, the product gas may be re-used at the site to heat various ancillary process components. When chlorinated organic compounds such as PCBs are treated, hydrogen chloride is also

produced. It is removed as an industrial grade acid in the gas scrubbing system.

The ECO LOGIC Process also employs "steam reforming/water shift" reactions to recover the hydrogen from the methane gas product. Methane and water react to produce hydrogen and carbon dioxide. The hydrogen may be recycled back into the reactor to maintain the reducing atmosphere.

Technology demonstrations have proven that the ECO LOGIC Process can achieve at least 99.9999 per cent destruction and removal efficiencies when applied to such organic contaminants as high strength PCB oil and PCB-contaminated soil and water.

TECHNOLOGY OPPORTUNITIES

ECO LOGIC has been developing this technology since 1986 and is now able to offer it commercially. The technology has been proven to be effective for high strength organic contaminants such as PCBs.

Currently, ECO LOGIC is pursuing other applications for the technology.

These include using it to treat chemical warfare agents, low-level radioactive mixed waste and municipal/industrial sewage sludge or biosolids. The United States Army has recently announced that the ECO LOGIC process will undergo a technology review as one of three new technologies which may be capable of safely disposing of chemical agents.

The first commercial-scale system was constructed in Ontario and shipped to Australia where it is processing obsolete pesticide residuals (DDT) and high strength PCB-contaminated oils and electrical equipment. General Motors of Canada Limited has contracted the second commercial-scale unit to recycle their inventory of PCB-contaminated electrical equipment, settled solids and other bulk solids. In addition, General Electric Canada Inc. and Eco Logic have a contract to destroy the above ground PCB-impacted materials at the Lansdowne and Davenport facility in Toronto.

PARTNERSHIP IN POLLUTION PREVENTION & RESOURCE CONSERVATION

Two phases of the development of this technology were partially funded by the Ontario Ministry of Environment and Energy.

This technology has received support from a number of partners during the development phase including the Canadian Department of National Defense under the Defense Industry Research Program, the US Environmental Protection Agency under the SITE Program, Environment Canada under the Great Lakes Cleanup Fund and the Canada-Ontario DESRT Program.

Industrial companies located in Ontario may seek ministry/industry services which will help them:

- * reduce, reuse and recycle solid waste;
- * effectively remediate historic pollution and destroy hazardous contaminants;
- * reduce or eliminate liquid effluent and gaseous emissions;
- * use energy and water more efficiently.

Equipment and service supply companies can benefit from the information provided on technologies identified for business development.

FOR FURTHER INFORMATION, PLEASE CONTACT

Jim Nash or Martin Hassenbach
ELI Eco Logic International Inc.
143 Dennis St.
Rockwood, Ontario
N0B 2K0
Tel: (519) 856-9591
Fax (519) 856-9235
sales@eco-logic-intl.com

Doug Vallery
Industry Conservation Branch
Ministry of Environment and Energy
56 Wellesley St., W.
14th Floor
Toronto, Ontario
M7A 2B7
Tel: (416) 327-8329
Fax (416) 327-1261

MINISTRY OF ENVIRONMENT & ENERGY SERVICES

For information on Ministry of Environment and Energy assistance to industry, please contact the Industry Conservation Branch at (416) 327-1492, or fax (416) 327-1261

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Renseignements en français : Ministère de l'Environnement et de L'Énergie
56 rue Wellesley ouest, Toronto (Ontario) M7A 2B7 Téléphone : (416) 327-1253 ou
Télécopieur : (416) 327-1261

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